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(56) Documents Cited

US 5996082 A

(58) Field of Search

UK CL (Edition S) G4A AFGN AKS

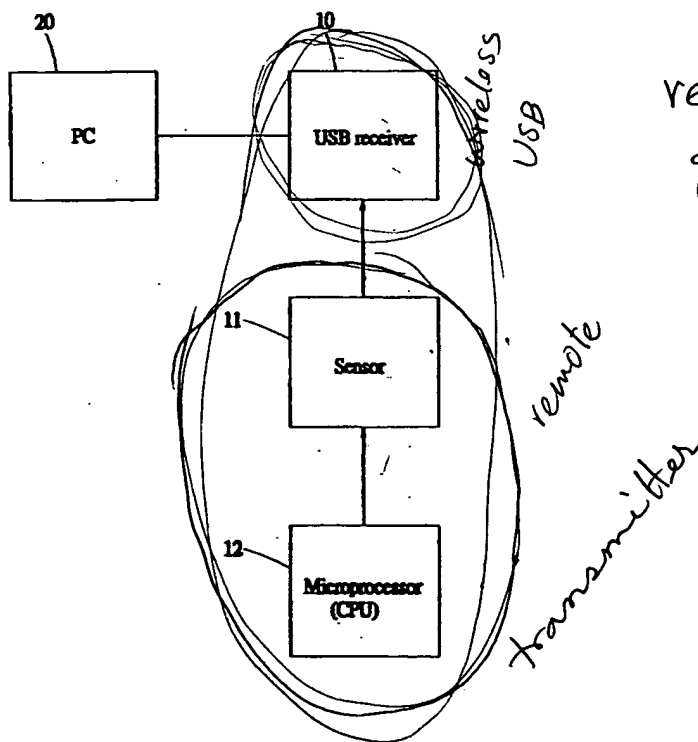
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Other: Online: WPI, PAJ, EPODOC, IEL

(54) Abstract Title

Power conservation using wireless USB devices

(57) A sensor that regularly detects wireless receiver signals, is controlled by a microprocessor that regularly wakes it to detect the signals. When there are signals it will proceed with remote wake up of a device and when there are no signals the device will remain in suspend. This will allow power to be conserved within the device. The sensor can regularly provide power using RC charging/discharging circuits or through WATCHDOG TIMEOUT.



*receive wireless
generate wake
up.*

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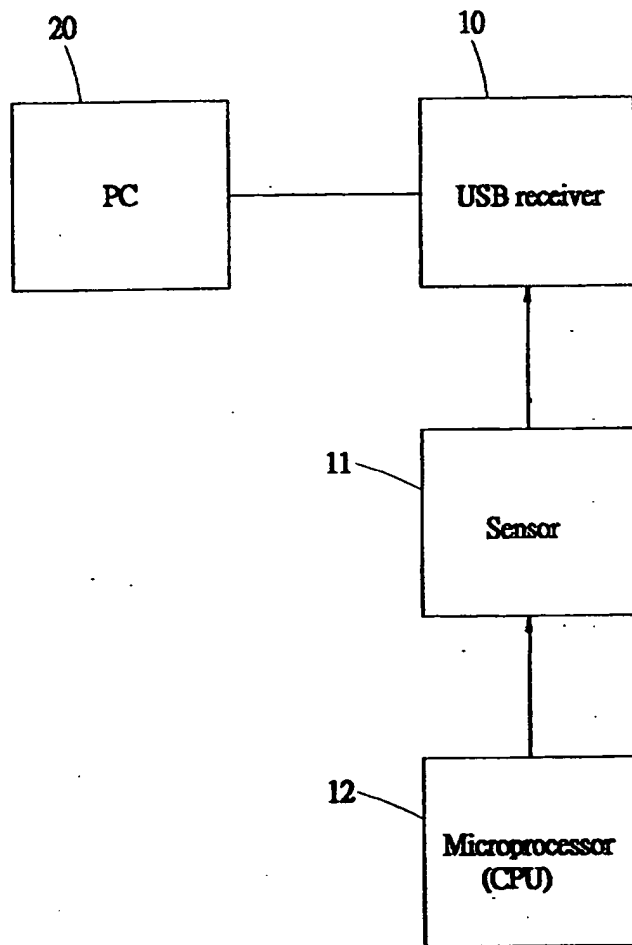


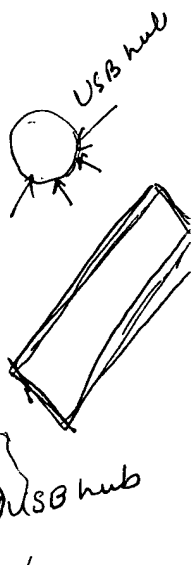
FIG.1

METHOD OF REMOTE START OF WIRELESS TRANSMISSION USB

The invention relates to a method of remote start of wireless transmission USB, for application between a computer and USB wireless perimeters, systems of unlimited perimeters, for determination whether to carry out wake-up functions with sensor that detects receiving signals, with the purpose of conservation of power consumption of USB when suspend, making the invention industrially applicable.

Between a conventional computer and its perimeters, an appropriate transmission medium shall be available for the connection of the signal wires, which are used for the switch between operation and data transmission; recently, there are wireless signal emitters and receivers to receive control signals emitted by various wireless perimeters, such as USB signal emitter, so that the USB perimeters could control computer operations through wireless means.

For the wireless perimeter, the computer USB signal emitter module and signal receiver module, when the system remains suspend, the USB keeps on consuming power as a waste. Besides, as the perimeter of the wake-up function of wireless perimeter remote control takes a fixed period of time to repeatedly send out identification codes, it could make the



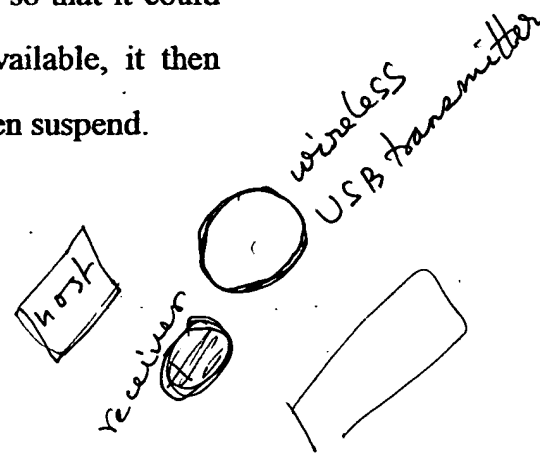
emitter module work repeatedly as a waste of energy. When the system remains suspend, this phenomenon could jeopardize the normal function of the remote wake-up.

The objective of the present invention aims is to provide a method of remote start of wireless transmission USB by means of establishing a sensor between the USB wireless perimeter and the computer host, so that the sensor could regularly supply power to the remote start for the detection of signals in the receiver and determine whether to carry out the wake-up function, as a way to converse power consumption with the USB suspend.

According to this invention, the method of remote start of the wireless USB is to establish a sensor that regularly wakes up either by means of R/C charging or discharging, or by WATCH DOG TIME OUT, so that it could detect whether the receiver is working, if signals are available, it then remain suspend to conserve power consumption of USB when suspend.

In the drawings:

Figure 1 shows the system diagram of this invention.



A method of remote start of wireless transmission USB of this invention is used between wireless perimeter computer 20, in particular, a computer system using USB keyboard and mouse.

In the system framework of the invention, as shown in Figure 1, the remote start of wireless transmission USB deals with a sensor 11 that is to detect signals from the USB receiver 10; the sensor 11 is controlled by microprocessor 12 that regularly wakes up to detect the USB receiver 10, when there are signals, it carries out REMOTE WAKEUP, if not, the system would then remain SUSPEND to conserve energy.

The sensor 11, RC charging/discharging circuits may be used to provide power regularly, so that the remote start could detect start signals. If yes, it could then proceed with the wake-up function and have the system work. If not, the system would remain suspend to conserve energy.

The sensor 11 could also regularly provides power by means of WATCH DOG TIME OUT, so that the remote start could detect for start signals. If yes, it could wake the system up to work. If not, the system could remain suspend to conserve energy.

The sensor 11 may also be a software or hardware device featuring the aforementioned characteristics that, through this sensor 11. When the remote start detects signals in the wireless perimeter, it could suggest that the RF module in the USB wireless perimeter is on to enter into the wake-up function. If the RF module does not work, the system would then remain suspend to conserve energy and this could reduce the time for USB's identification of signals, while improving the overall efficiency.

This method makes the USB wireless perimeter, when not on, keep

the system suspend to conserve energy, so that both the receiver and the emitter could improve the transmission quality.

Therefore, the method of remote start of wireless transmission USB of this invention is to regularly provide power to the receiver for the detection of signals through a simple signal sensor, so that it could keep the remote start and USB in normal operations. The method not only conserves energy, but also reduces signal identification time, so that USB signal transmission could be conducted more steadily as related above.

CLAIMS:

1. A method of remote start of wireless transmission USB applying on computer systems of wireless perimeters as a sensor that regularly detects USB receiver signals and the sensor is controlled by microprocessors that regularly wake up to detect the USB receiver, when there are signals, the system would proceed with REMOTE WAKE UP ; when there is no signal, the system would remain SUSPEND to conserve energy.
2. A method of remote start of wireless transmission USB as claimed in Claim 1, wherein sensor regularly provides power using RC charging and discharging circuits, so that the remote start detects for start signals.
3. A method of remote start of wireless transmission USB as claimed in claim 1, wherein the sensor regularly provides power through WATCHDOG TIMEOUT, so that the remote start could detect for start signals.
4. A method of remote start of wireless transmission USB as claimed in claim 1, wherein the hardware and software regularly provides power to the remote start for its detection of start signals.

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CLAIMS

1. A method of remotely starting a wireless USB peripheral device in a computer system, the computer
5 system comprising a computer host and the wireless USB peripheral device arranged to receive signals from the computer host, the wireless USB peripheral device having:
a receiver for receiving signals from the computer host;
10 a sensor for detecting signals in the receiver; and
a microprocessor arranged to wake up the sensor;
wherein the microprocessor regularly wakes up the sensor, whereupon the sensor checks whether the receiver has received any signals or not;
15 whereby if the sensor detects no signal, the wireless USB peripheral device remains in SUSPEND mode,
and
if the sensor detects a signal, the computer system proceeds with REMOTE WAKE UP to wake up the wireless USB
20 peripheral device.

2. A method of remotely starting a wireless USB peripheral device according to claim 1, wherein R/C

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charging/discharging circuits regularly provide power to the sensor for detecting signals in the receiver.

3. A method of remotely starting a wireless USB
5 peripheral device according to claim 1, wherein WATCH DOG
TIME OUT regularly provides power to the sensor for
detecting signals in the receiver.

4. A method of remotely starting a wireless USB
10 peripheral device according to claim 1, wherein the
sensor comprises hardware and software for regularly
detecting signals in the receiver.





INVESTOR IN PEOPLE

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Claims searched: 1-4

Examiner: Natasha Chick
Date of search: 28 August 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): G4A AFGN AKS

Int Cl (Ed.7): G06F 13/10

Other: Online: WPI, EPODOC, PAJ, IEL

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 5996082 A CORTOPASSI, Figure 1, Line 20, column 8 - line 19, column 14	1 and 4

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.